

CLAIMS

1. A method for operating a first node in a label switched network, said method comprising:

5 establishing a link bundle comprising a plurality of component links between said first node and a second node;

upon establishment of an LSP including said first node and said second node, selecting a first component link of said link bundle as a primary component link to assign to said LSP;

10 selecting one or more component links of said link bundle other than said first component link as one or more secondary component links to assign to said LSP;

sending traffic of said LSP over said primary component link until a failure of said primary component link; and

after failure of said primary component link, sending traffic of said LSP over said
15 one or more secondary component links instead of said primary component link.

2. The method of claim 1 wherein information about aggregate characteristics of said link bundle is advertised by said first node to other nodes but information about characteristics of individual ones of said plurality of component links
20 is not advertised.

3. The method of claim 1 wherein said one or more secondary component links comprise exactly one secondary component link.

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4. The method of claim 3 wherein, in advance of said failure, bandwidth for use by said LSP is allocated on said exactly one secondary component link responsive to a bandwidth requirement of said LSP.

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5. The method of claim 3 further comprising:

while sending traffic of said LSP over said exactly one secondary component link, designating said exactly one secondary component link as a new primary component link and selecting a new secondary component link responsive to a bandwidth requirement of said LSP.

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6. The method of claim 1 wherein no bandwidth is allocated on said one or more secondary component links for use by said LSP.

7. The method of claim 6 wherein sending traffic of said LSP over said one or more secondary component links comprises:

assigning lower priority to traffic of said LSP compared to other traffic carried by
5 said one or more secondary component links.

8. The method of claim 6 further comprising:

while sending traffic of said LSP over said one or more secondary component
links, selecting a component link of said link bundle as a new primary component link;
10 and thereafter

sending traffic of said LSP over said new primary component link.

9. The method of claim 8 further comprising:

if said new primary component link is one of said one or more secondary
15 component links, selecting a new secondary component link.

10. The method of claim 6 further comprising:

while sending traffic of said LSP over said one or more secondary component
links, searching for a component link of said link bundle to serve a new primary
component link; and thereafter

upon failure to identify a component link having sufficient available bandwidth to server as a new primary component link, signaling a head-end of said LSP to reroute said LSP.

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11. A computer program product for operating a first node in a label switched network, said computer program product comprising:

code that establishes a link bundle comprising a plurality of component links between said first node and a second node;

10 code that, upon establishment of an LSP including said first node and said second node, selects a first component link of said link bundle as a primary component link to assign to said LSP;

code that selects one or more component links of said link bundle other than said first component link as one or more secondary component links to assign to said LSP;

15 code that sends traffic of said LSP over said primary component link until a failure of said primary component link;

code that, after failure of said primary component link, sends traffic of said LSP over said one or more secondary component links instead of said primary component link; and

20 a computer-readable medium that holds the codes.

12. The computer program product of claim 11 wherein information about aggregate characteristics of said link bundle is advertised by said first node to other nodes but information about characteristics of individual ones of said plurality of component links is not advertised.

13. The computer program product of claim 11 wherein said one or more secondary component links comprise exactly one secondary component link.

14. The computer program product of claim 13 wherein, in advance of said failure, bandwidth for use by said LSP is allocated on said exactly one secondary component link responsive to a bandwidth requirement of said LSP.

15. The computer program product of claim 13 further comprising:
code that, while sending traffic of said LSP over said exactly one secondary component link, designates said exactly one secondary component link as a new primary component link and selects a new secondary component link responsive to a bandwidth requirement of said LSP.

16. The computer program product of claim 11 wherein no bandwidth is allocated on said one or more secondary component links for use by said LSP.

5 17. The computer program product of claim 16 wherein said code that sends traffic of said LSP over said one or more secondary component links comprises:

code that assigns lower priority to traffic of said LSP compared to other traffic carried by said one or more secondary component links.

10 18. The computer program product of claim 16 further comprising:

code that, while traffic of said LSP is sent over said one or more secondary component links, selects a component link of said link bundle as a new primary component link; and

code that sends traffic of said LSP over said new primary component link.

15 19. The computer program product of claim 18 further comprising:

if said new primary component link is one of said one or more secondary component links, selecting a new secondary component link.

20. The computer program product of claim 16 further comprising:

code that, while traffic of said LSP is sent over said one or more secondary
component links, searches for a component link of said link bundle to serve a new
5 primary component link; and

code that, upon failure to identify a component link having sufficient available
bandwidth to server as a new primary component link, signals a head-end of said LSP to
reroute said LSP.

10 21. A network device that operates a first node in a label switched network,
said network device comprising:

a processor; and

a memory device storing instructions executed by said processor, said instructions
comprising:

15 code that establishes a link bundle comprising a plurality of component
links between said first node and a second node;

code that, upon establishment of an LSP including said first node and said
second node, selects a first component link of said link bundle as a primary component
link to assign to said LSP;

code that selects one or more component links of said link bundle other than said first component link as one or more secondary component links to assign to said LSP;

5 code that sends traffic of said LSP over said primary component link until a failure of said primary component link; and

code that, after failure of said primary component link, sends traffic of said LSP over said one or more secondary component links instead of said primary component link.

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22. Apparatus for operating a first node in a label switched network, said apparatus comprising:

means for establishing a link bundle comprising a plurality of component links between said first node and a second node;

15 means for, upon establishment of an LSP including said first node and said second node, selecting a first component link of said link bundle as a primary component link to assign to said LSP;

means for selecting one or more component links of said link bundle other than said first component link as one or more secondary component links to assign to said

20 LSP;

means for sending traffic of said LSP over said primary component link until a failure of said primary component link; and

- means for, after failure of said primary component link, sending traffic of said
- 5 LSP over said one or more secondary component links instead of said primary component link.